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COMMENTARY

Lessons to be learned from the ebolavirus outbreak in West Africa

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The ebolavirus epidemic in West Africa, which is the largest outbreak in history, is still not under control. There is a need for swift development of vaccines and therapeutics from an experimental stage to clinical application.

On August 8 the World Health Organisation (WHO) declared that the ebolavirus outbreak in West Africa constitutes an International Public Health Emergency. WHO specifically states: that the outbreak is an extraordinary event and a public health risk to other states; that the possible consequences of further international spread are particularly serious in view of the virulence of the virus, the intensive community and health facility transmission patterns and the weak health systems in the currently affected countries; and that a coordinated international response is deemed essential to stop the spread of ebolavirus disease.

Since its discovery in 1976, ebolavirus has re-emerged periodically; most of the outbreaks have been confined to remote areas in Central Africa and have never involved more than 500 cases. The present outbreak is different. Since the first cases were observed in February in forested areas of Southwestern Guinea, it has grown steadily in terms of infected people and geographic spread. Besides Guinea, large parts of Liberia and Sierra Leone are now disease-ridden. It has also been exported to Nigeria, and the invasion of large, densely populated cities, such as Monrovia, is of particular concern. The dramatic situation in these areas is illustrated by reports from a hospital in Sierra Leone where many patients and more than 20 nurses have died, which is just a fraction of the total loss among health care workers in the affected areas. It is therefore not surprising that many people see the hospitals as death traps and desperately avoid going there, thereby greatly increasing the risk of spreading the disease. As of August 10, almost 2000 cases and 1000 deaths have been reported, with no end to the outbreak in sight. Almost from its outset, local health systems have seen strong support from international relief organisations such as Medecins Sans Frontieres (MSF) and European Mobile Laboratory (EML), among others. For some time, MSF has been calling for a massive increase in the medical, epidemiological, and public health response, which is desperately needed to save lives and reverse the course of the epidemic.

Ebolavirus disease has a zoonotic background. Fruit bats are believed to be the natural reservoir of the virus, but the source of the outbreak in West Africa has not yet been identified. The Zaire species of ebolavirus, which appears to be responsible for this outbreak, causes the most severe form of human hemorrhagic fever, with case fatality rates of up to 90%. The disease is caused by high viral loads that lead to immune and vascular dysregulation. Major symptoms are fluid distribution problems, hypotension, coagulation disorders and bleeding, which finally result in the sudden onset of severe shock.

Registered medicines and vaccines against ebolavirus infection are not available, but there is now a vigorous debate in progress surrounding the use of experimental treatments. Several such options have been developed over the past decade. These include, among others, siRNA-based antivirals and monoclonal antibodies for therapeutic use, as well as vaccines that are based on recombinant vesicular stomatitis virus[1] and adenovirus.[2] The recent treatment of two health care workers from US aid organisations has raised questions not only about whether medicines that have not been tested or shown to be safe in humans should be used in an emergency situation, but also about who should reveive the very limited supplies of these medicines that are available. The process of moving an experimental vaccine or drug candidate into clinical trials is, admittedly, time-consuming and expensive. But the thought that many lives could have been saved if this process had been accelerated over recent years is embarrassing.

There are a number of lessons that we must learn from this outbreak, the most important of which are: first, we have to recognize that an outbreak of a re-emerging agent, such as Ebolavirus, may not show the patterns we are familiar with from the past. Outbreaks may occur in regions where they have not been observed before, and the dynamics of the outbreaks may be different too. Second, there is clearly a need for vaccines and antiviral therapeutics, and they must be available in sufficient quantities prior to the onset of any outbreak. Third, the process of developing a drug or vaccine from an experimental stage to clinical application must be accelerated. Momentum must not be lost just because the virus has disappeared from the scene. Preparations must be made in anticipation of another outbreak. Finally, there should be instruments that allow swift decisions on the use of experimental drugs and vaccines in cases of emergency.

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